

AMENDMENTS TO THE CLAIMS

Claims 1-28 (Cancelled)

Claim 29 (New) A modified animal fiber having scales in original form on the surface portion of the fiber and being oxidized to a degree of oxidation of an -S-S- bond in an epidermal cell of the animal fiber of not less than 0.1 of relative absorbance in an absorption band of -SO₃H group and not less than 0.08 of relative absorbance in an absorption band of -S-SO₃Na group (Bunte salts) with an absorbance of an absorption band corresponding to amide I set to 1 in a reflection FT-IR measuring method,

having such epicuticle layers on the surface of the scales as confirmed by Allwörden reaction, the epicuticle layer adding such water repellent property as originally possessed by the animal fiber, and

showing shrink proofing of an area shrinkage rate of not more than 8% in a three-hour aqueous washing when measured as a felting shrinkage rate in conformity with Woolmark Test Method 31 and pilling resistance of not lower than third class in JIS L-1076.6.1A method,

said fiber produced by a process which comprises:

a) a first step in which a -S-S- bond in an animal fiber cuticle cell is treated with an oxidizer having an ability under acidic conditions to oxidize a cystine -S-S- bond in an animal fiber,

b) a second step in which the primary-oxidized -S-S- bond is treated by oxidation with ozone under acidic conditions into any one or more higher order oxidized states of di, tri or tetra-oxidized state, and

c) a third step in which said -S-S- bond in higher oxidized state is treated by reductive cleavage.

Claim 30 (New) The animal fiber according to Claim 29, wherein, as a measure of shrink proofing, the value represented by a difference ($\mu_a - \mu_w$) between the coefficient of friction in the tip to root direction (μ_w) with respect to a fiber direction, measured in accordance with JIS L-1015 method, is lowered by 30% or more in comparison with the difference ($\mu_a - \mu_w$) of untreated

animal fiber in coefficient of static friction or in coefficient of dynamic friction, with the value of μ_a being approximately the same as a value in the case of the untreated animal fiber, and the value of μ_w being higher by 30% or more in comparison with a value in the case of the untreated animal fiber.

Claim 31 (New) The animal fiber according to Claim 29, wherein, assuming that an absorbance of an absorption band corresponding to amide I is set to 1 in a reflection FT-IR measuring method, the degree of oxidation of a -S-S- bond (cystine bond) in an epidermal cell of the animal fiber is represented by a relative absorbance of not less than 0.1 in an absorption band of -SO₃H group (sulfonic acid group) and/or a relative absorbance of not less than 0.08 in an absorption band of -S-SO₃Na group (Bunte salts).

Claim 32 (New) The animal fiber according to Claim 29, wherein, as a measure of the shrink proofing, an animal fiber has an area of shrinkage rate of not more than 8% in a three-hours aqueous washing, when measured as a felting shrinkage rate in conformity with a WM TM 31 method (Woolmark Test Method 31), and/or wherein, as a measure of shrink proofing, the value represented by a difference ($\mu_a - \mu_w$) between the coefficient of friction in the tip to root direction (μ_a) and the coefficient of friction in the root to tip direction (μ_w) with respect to a fiber direction, measured in accordance with JIS L-1015 method, is lower by 30% or more in comparison with the difference ($\mu_a - \mu_w$) of untreated animal fiber in coefficient of static friction or in coefficient of dynamic friction, the value of μ_a being approximately the same as a value in the case of the untreated animal fiber, and the value of μ_w being higher by 30% or more in comparison with a value in the case of the untreated animal fiber, and further, wherein the pilling resistance is not lower than third class in JIS L-1076.6.1A method.

Claim 33 (New) The animal fiber according to Claim 29, wherein the animal fiber is one selected from the group consisting of wool, mohair, alpaca, cashmere, llama, vicuna, camel and angora.

Claim 34 (New) The animal fiber according to Claim 32, wherein the animal fiber is one selected from the group consisting of wool, mohair, alpaca, cashmere, llama, vicuna, camel and angora.

Claim 35 (New) The animal fiber of any one of Claims 29 to 35, produced by a method which comprises;

- a) a first step in which a -S-S- bond in an animal fiber cuticle cell is treated by primary oxidation with an oxidizer having an ability to oxidize a cystine -S-S- bond in animal fiber,
- b) a second step in which the primary-oxidized -S-S- bond is treated by oxidation with ozone into any one or more higher order oxidized states of di, tri or tetra-oxidized state, and
- c) a third step in which said -S-S- bond in higher oxidized state is treated by reduction of cleavage.

Claim 36 (New) The animal fiber of Claim 35, wherein the oxidizer is one or a mixture of two or more selected from the group consisting of persulfuric acid, peracetic acid, performic acid, neutral salts and acidic salts of these per-acids, potassium permanganate and hydrogen peroxide.

Claim 37 (New) The animal fiber of Claim 35, wherein the first step is conducted by a pad steam method of animal fiber into aqueous solution of oxidizing agent.

Claim 38 (New) The animal fiber of Claim 36, wherein the first step is conducted by a pad steam method of animal fiber into aqueous solution of oxidizing agent.

Claim 39 (New) The animal fiber of Claim 35, wherein the oxidation treatment with ozone is conducted by blowing aqueous ozone treating liquid containing ozone in the form of ultrafine bubbles of 5 μ or less to animal fiber in this ozone treating liquid.

Claim 40 (New) The animal fiber of Claim 35, wherein the animal fiber is used as cloth or sliver mainly composed of animal fibers.